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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/691,881	10/23/2003	Arne W. Ballantine	END9-2000-0063-US3	9017

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EXAMINER	
HOANG, TU BA	
ART UNIT	PAPER NUMBER
2832	

SHORTENED STATUTORY PERIOD OF RESPONSE	MAIL DATE	DELIVERY MODE
3 MONTHS	03/13/2007	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

Office Action Summary	Application No.	Applicant(s)	
	10/691,881	BALLANTINE ET AL.	
	Examiner	Art Unit	
	Tu Hoang	2832	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *13 December 2006*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *34-53,55-63,70,71 and 74-80* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☒ Claim(s) *80* is/are allowed.

6)☒ Claim(s) *34-43,45,47,49,51,53,55-59,62,63,70,71 and 74-79* is/are rejected.

7)☒ Claim(s) *44,46,48,50,52,60 and 61* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

Response to Amendment/Argument

Applicant's arguments/arguments filed 12/13/06 have been fully considered but are moot in view of new grounds of rejection:

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Amended claims 63, 70-71, and 74-76 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

In claim 63, there is insufficient antecedent basis for "the electrically conductive material" recited at lines 6 and 14 in the claim. It is unclear whether such "electrically conductive material is the same for both the first portion and the second portion. It seems that the recitation at lines 6-8, (i.e., ".....has resulted from a laser heating of the electrically conductive material with the first structure") implied they are different from one to another. Clarification is needed.

In claim 70, there is insufficient antecedent basis for "the structured cell" recited at line 3 in the claim or from the preceding claim. It is unclear for which one of the first or the second structured cell.

In claim 75, there is a missing text after "conductive" recited at line 6. The word" contact" is suggested.

In claim 76, there is a missing text after "dR/dt" recited at line 14 which renders the claim indefinite.

The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 34-41, 47, 49, and 51 are rejected under 35 U.S.C. 102(b) as being anticipated by Bennett et al (US 3,842,495) cited in the previous Office Action. Bennett et al shows an electrical structure (Figure 5) comprising at least a resistor 19 having a length L and an electrical resistance R(t) at a time t (column 3, lines 39-42, i.e., a change in the electrical resistance to a desired value within the range of interest and lines 54-55, i.e., a time interval of between 0.10 and 60 seconds), and a laser radiation 130 (shown as 131 in Figure 5 instead of 131) from source or generator 131 as set forth at column 3, lines 37-38 directed onto a portion of the resistor 19, wherein the portion of the resistor includes a fraction F of length L (column 3, lines 43-44, i.e., the beam may be caused to impinge on successively different portions), and wherein the laser radiation heats the portion of the resistor 19 such that the electrical resistance R(t)

instantaneously changes at a rate dR/dt (set forth at the previous note at column 3, lines 39-42 and further at lines 52-56, i.e., depending on the amount of resistance desired and the intensity of the laser radiation or beam).

Regarding the recitation of the "semiconductor" amended to claim 34, Bennett et al further shows that the resistor 19 can be coupled to a semiconductor substrate since as noted at column 2, lines 30-35, the ceramic substrate or chip may consist of barium titanate material which is considered these semiconductor material. As previously set forth, Bennett et al has disclosed different portions on the resistor 19 can be subjected to laser radiation for desired resistance values where it is in the inherency that each fraction F of the length L of each portion can be predetermined for the desired resistance value upon laser radiation of the resistor 19 during experimentation or manufacture and the resistor 19 can be coupled to a semiconductor substrate 20 as shown in Figure 3 and an electrical circuit element 34,35 is shown in Figure 5 which is formed an electrical circuit that includes the electrical circuit element 34,35 and the resistor 19.

Regarding claims 35-37, as the laser radiation or beam directed or caused to impinge on successively different portions on the resistor, where each portion is inherently included a fraction of its length with the spot dimension of the laser radiation or beam must inherently be less than the length of each portion (depend upon the desired beam intensity, frequency, or wave length for the desired resistance value noted at column 3, lines 57-65) and it is clear that a fraction of a length must inherently be at least less than or equal to such length but not longer or larger than such length. For a desired unit length, L is at least equal to 1 where F must be within the range of ≤ 1. Regarding the amended claim 35, As Bennett et al discloses at column 2, lines 25-38, the resistor can be produced by mixing noble metal oxide particulate with glass frit and liquid resin on a ceramic substrate or chip where suitable noble metals and oxides include ruthenium, ruthenium silver, and palladium silver paste and glass frit my consist of lead borosilicate glass and the chip or substrate may consist of barium titanate ceramic material. The Examiner's position is that each of the noble metal oxide particulate, glass frit, and resin would inherently comprises a cell where such cells are in direct mechanical contact each other since they are forming the mixture for the resistor material and where at least either one of the noble metal oxide particulate and the glass frit such glass frit would be structurally changed by the laser radiation.

Regarding claims 38-40, the electrical resistance can be varied at different rate dR/dt for each desired value and Bennett et al has inherently shown the laser beam or radiation impingement on the relative moving resistor is continued for a time interval of between 0.01 and 60 seconds as previously set forth, wherein such rate can be increased or decreased or unchanged depend upon the desired resistance value. Regarding claim 41, as the claim being interpreted broad, that is at the time the laser beam caused to impinge on the portion at the surface of the resistor during trimming operation, the dimension or width of the material to be removed and vaporized from the surface portion of the resistor is likely the same as the beam impingement spot, Bennet et al has indicated at column 3, lines 42-56, the laser beam may caused to impinge on successively different portions of the resistor for a precise desired value thereby to

effect the change in electrical resistance to a desired value at the temperature within the range of interest and typical beam impingement is continued for a time interval that is dependent on the amount of resistance increase desired and the intensity of the beam (emphasis added), it is inherently that each beam impingement will cause such removal of material at such portion to form at least a trimmed portion on the resistor, where such trimmed portion is considered as the product of fraction F and the length L, and since "about 1 micron" is a very broadly recited small value for the width of the trimmed portion, any value of the width for the corresponding trimmed portion can be considered as within the dimension, width or length of "about 1 micron".

Regarding claims 47, 49, 51 Bennett et al also discloses the resistor comprises a mixture of noble metals and oxides including ruthenium, ruthenium silver, palladium silver paste, lead borosilicate glass frits, barium titanate (column 2, lines 31-35) or also chromium and alloys therewith such as Nichrome (column 4, lines 5-7), in which such mixture is considered an equivalence of amorphous metallic material mixed with crystalline metallic material or polycrystalline metal and it is inherently that upon impingement of the laser radiation onto the portion of the resistor, the cell of the amorphous metallic material will be coupled to the cell of the crystalline metallic material within the resistor 19 as the result from the interaction of the laser radiation on the portion in the resistor 19 where at least a portion of the crystalline metallic material would have resulted from melting of at least part of the amorphous metallic material. Bennett et al has inherently disclosed the functional characteristics of the material used in the resistor during subjecting to laser radiation while claims 47 and 49 are merely reciting such inherency of functional characteristic. Regarding the amended features noted in claims 47 and 49, the mixture of Bennett et al before impinged by laser radiation is considered as the recited amorphous metallic material or polycrystalline metal having the first crystalline phase for first material and after such mixture being impinged by the laser, the mixture is considered as the recited second material of crystalline metallic material having the second crystalline phase (i.e., since at least glass frit is melted and crystalline by the laser radiation)

Amended claims 34-43, 45, 53, 55-59, 62, and newly added claims 77-79 are rejected under 35 U.S.C. 102(b) as being anticipated by Chapel, Jr. et al (US 4,907,341). Chapel et al shows all features of the claimed invention including an electrical structure (Figure 2) comprising a resistor 46 of length L and comprising N layers 42,44 (i.e., N=2 where at column 4, lines 20-21, the combination of resistive material 42 and adjustment material 44 form the compound resistor 46), wherein a portion of the resistor 46 includes a fraction of the length L and electrical resistance characteristic which can be described in the similar manner noted in the rejection above. Chapel et al further shows the resistor 46 includes the first layer 42 of an electrical conductive material or resistive material, the second layer 44 of different electrical conductive material (i.e., adjustment material) is in electrically conductive contact with the first layer 42 an electrical resistance, and a laser radiation (i.e. laser trimming) directed onto a portion 52 of the resistor 46, wherein the portion of the resistor inherently includes a fraction of its length, and wherein the laser radiation heats the

portion 52 of the resistor 46 where the electrical resistance is inherently and instantaneously changed at a rate based on trimming time interval, each one of the layers 42,44 has its own cell and material within the portion of the resistor 46 to be trimmed, wherein the cell of the first layer 42 is coupled to the cell of the second layer 44 and the chemical combination of the resistor 46 at the portion 52 to be treated comprises the combination of the materials from both first and second layers 42,44 and the resistor 46 is coupled to a semiconductor substrate 12 of alumina.

Amended claims 34-43, 45, 47, and 49 are rejected under 35 U.S.C. 102(b) as being anticipated by Bartush et al (US 5,233,327). Bartush et al discloses all features of the claimed invention including an electrical structure which comprises a resistor 10 (shown in Figure 2) having a length L and an electrical resistance or sheet resistance (column 4, line 34), wherein a laser radiation is directed onto a portion (12,or 13, or 14) as noted at column 4, lines 34-37, the portion of the resistor includes a fraction L2' of the length L, and wherein the laser radiation heats the portion of the resistor uch that the electrical resistance instantaneously changes as the desired rate and the resistor can be coupled to a semiconductor substrate or device as set forth at column 1, line 53. Bartush et al further discloses the laser impingement spot is 5 micron (at column 4, line 51) which can be considered "about" 1 micron for the recited product of F and L noted in claim 41. Each portion of 12,13,14 can be interpreted as the recited first, second and third cells noted in claim 35, wherein each portion is included chromium alloy doped with oxygen and silicon (column 3, lines 20-35) which is an equivalent of an amorphous metallic material before being impinged by the laser).

Claims 44,46,48,50,52 and 60-61 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Claims 63, 70-71, and 74-76 would be allowable upon overcome the rejection under 35 USC 112.

Claim 80 is allowed over the art of record.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Tu Ba Hoang whose telephone number is (571) 272-4780. The examiner can normally be reached on Mon-Thu from 6:00AM to 6:30PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Elvin Enad can be reached on (571) 272-1990. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Tu Ba Hoang
Primary Examiner
Art Unit 2832

March 01, 2007